

Appl. No.

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification:

Before the first line of the specification, add the following:

" REFERENCE TO RELATED APPLICATIONS

This application is a national phase application under 35 U.S.C. 371 of
PCT/CA00/00870."

SUMMARY OF THE INVENTION

The present invention is directed towards the provision of a recombinantly-produced purified and isolated outer membrane protein of *Moraxella catarrhalis* and other *Moraxella* strains, having an apparent molecular mass of about 200 kDa, as well as genes encoding the same from various strains of *Moraxella catarrhalis*.

In one aspect of the present invention, there is provided an isolated and purified nucleic acid molecule having (a) a nucleotide sequence set forth in Figure 3, 4 or 5 (SEQ ID Nos: 5, 6, 8, 10) for *Moraxella catarrhalis* strains 4223, Q8 and LES-1 respectively or the complementary sequence thereto; (b) a nucleotide sequence encoding an about 200 kDa outer membrane protein of a strain of *Moraxella catarrhalis* and having the derived amino acid sequence shown in Figures 3, 4 or 5 (SEQ ID Nos: 7, 9, 11) for *Moraxella catarrhalis* strains 4223, Q8 and LES-1 respectively; and (c) a nucleotide sequence encoding an about 200 kDa outer membrane protein of another strain of *Moraxella catarrhalis* which is characterized by a tract of consecutive G nucleotides which is 3 or a multiple thereof in length, an ATG start codon about 80 to 90 bp upstream of said tract and said tract being located between about amino acids 25 and 35 encoded by the nucleotide sequence.

The another strain of *Moraxella catarrhalis* in (c) is a strain as identified in Table 1A other than strains 4223, Q8 and LES-1 and expressing an about 200 kDa protein.

In another aspect of the invention, there is provided an isolated and purified nucleic acid molecule having a nucleotide sequence selected from the group consisting of (a) a nucleotide sequence set forth in Figure 8 (SEQ ID No: 12) for a 5'-truncation of the gene encoding an about 200 kDa outer membrane protein of *Moraxella catarrhalis* strain 4223 contained in pKS348; (b) a nucleotide sequence encoding the derived amino acid sequence set forth in Figure 9 (SEQ ID No: 13) for a N-terminal truncation of an about 200 kDa outer membrane protein of *Moraxella catarrhalis* strain 4223 produced by pKS348; (c) a nucleotide sequence set forth in Figure 21 (SEQ ID No: 45) for a 5' truncation of the gene encoding an about 200 kDa outer membrane protein of *Moraxella catarrhalis* strain 4223 contained in pQWF; (d) a nucleotide sequence encoding the derived amino acid sequence set forth in Figure 21 (SEQ ID No: 46) for a N-terminal truncation of an about 200 kDa

CLAIMS

What we claim is:

1. An isolated and purified nucleic acid molecule having a nucleotide sequence selected from the group consisting of:
 - (a) a nucleotide sequence set forth in Figure 3, 4 or 5 (SEQ ID Nos: 5, 6, 8, 10) for *Moraxella catarrhalis* strains 4223, Q8 and LES-1 respectively or the complementary sequence thereof,
 - (b) a nucleotide sequence encoding an about 200 kDa outer membrane protein of a strain of *Moraxella catarrhalis* and having the derived amino acid sequence shown in Figures 3, 4 or 5 (SEQ ID Nos: 7, 9, 11) for *Moraxella catarrhalis* strains 4223, Q8 and LES-1 respectively, and
 - (c) a nucleotide sequence encoding an about 200 kDa outer membrane protein of another strain of *Moraxella catarrhalis* which is characterized by a tract of consecutive G nucleotides which is 3 or a multiple thereof in length, an ATG start codon about 80 to 90 bp upstream of said tract and said tract being located between about amino acids 25 and 35 encoded by the nucleotide sequence.
2. The nucleic acid molecule of claim 1 wherein said another strain of *Moraxella catarrhalis* in (c) is a strain as identified in Table 1A other than strains 4223, Q8 and LES-1 and expressing an about 200 kDa protein.
3. An isolated and purified nucleic acid molecule having a nucleotide sequence selected from the group consisting of:
 - (a) a nucleotide sequence set forth in Figure 8 (SEQ ID No: 12) for a 5'-truncation of the gene encoding an about 200 kDa outer membrane protein of *Moraxella catarrhalis* strain 4223 contained in pKS348,
 - (b) a nucleotide sequence encoding the derived amino acid sequence set forth in Figure 9 (SEQ ID No: 13) for a N-terminal truncation of an about 200 kDa outer membrane protein of *Moraxella catarrhalis* strain 4223 produced by pKS348,